

REMARKS

In the Office Action dated July 22, 2004, claims 1-33 were presented for examination. Claims 4, 5, 17, and 18 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Claims 5 and 18 were considered as containing allowable subject matter, but were rejected based on a rejected base claim. Claims 1-4, 6, 7, and 33 were rejected under 35 U.S.C. §102(e) as being anticipated by *Henderson et al.*, U.S. Patent No. 6,446,188. Claims 14-17 and 28-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Henderson et al.* in view of *Gulick et al.*, U.S. Patent No. 6,314,501.

Applicants wish to thank the Examiner for the careful and thorough review and action on the merits in this application.

I. 35 U.S.C. §112, second paragraph

In the Office Action of July 22, 2004, the Examiner rejected claims 4, 5, 17, and 18 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have amended claim 4 and 17 to clarify the limitation pertaining to "two or more nodes". Claims 5 and 18 both depend from amended claims 4 and 17. Accordingly, in view of the amendment to claims 4 and 17, Applicants respectfully requests that the Examiner remove this rejection of claims 4, 5, 17, and 18.

II. 35 U.S.C. §102(e) - anticipated by *Henderson et al.*

In the Office Action of July 22, 2004, the Examiner rejected claims 1-4, 6, 7, and 33 under 35 U.S.C. §102(b) as being anticipated by *Henderson et al.*, U.S. Patent No. 6,446,188.

Henderson et al. discloses a system for mapping virtual address space objects to physical address space. A host processor virtual address space stores memory objects. An address translation module is provided to translate the virtual address spaces for the memory objects to

physical space addresses for memory elements. However, *Henderson et al.* does not disclose platform firmware for dynamically routing between the virtual address and the physical address, as claimed by Applicants. Accordingly, the method and system *Henderson et al.* operate under different parameters and a different environment than that claimed by Applicants.

In order for the claimed invention to be anticipated under 35 U.S.C. §102(e), the prior art must teach all claimed limitations presented by the claimed invention. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP §2131 (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F. 2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987)). As mentioned above, *Henderson et al.* does not show all of the elements as claimed by Applicants in pending claims 1-4, 6, 7, and 33. Specifically, *Henderson et al.* does not support the use of platform firmware, as shown in Applicant's amended claims 1 and 33. Accordingly, *Henderson et al.* clearly fails to teach the limitations pertaining to dynamic routing of virtual addresses as presented in Applicant's pending claims 1-4, 6, 7, and 33.

III. 35 U.S.C. §103(a) - unpatentable over *Henderson et al.* in view of *Gulick et al.*

In the Office Action of July 22, 2004, the Examiner rejected claims 14-17, 27, and 28-32 under 35 U.S.C. §103(a) as being unpatentable over *Henderson et al.* in view of *Gulick et al.*

Applicants hereby incorporate the comments to *Henderson et al.* made above.

The *Gulick et al.* patent ('501) discloses a computer system with a multiple processing modules configured into partitions. Each partition operates under the control of a separate operating system. The main memory has a shared memory window to which two or more partitions have shared access. The physical address space of the processors in each partition is mapped to the shared memory window assigned to each partition. This enables the shared memory window to appear to the operating system to be at the same base address. Furthermore, *Gulick et al.* alludes to the fact that "various components can be implemented in ... firmware." See Col. 60, line 55.

However, the system of *Gulick et al.* does not disclose a method or system for routing I/O between a virtual resource address and a physical resource address. Furthermore, *Gulick et al.* does not disclose the use of firmware for such a purpose. Rather, *Gulick et al.* is used in association with a computer system having multiple partitions and a memory window shared between two or more partitions. The memory window functions as a shared resource between multiple partitions. However, there is no teaching, suggestion, or motivation to apply the shared communication with a memory window in a multiple partition system with routing of I/O between a virtual and physical resource address. Although *Gulick et al.* briefly mentions that various components may be implemented in firmware, *Gulick et al.*, does not elaborate as to what elements may be implemented in firmware, or how such an implementation would function. Accordingly, *Gulick et al.* supports communication in a shared memory window between two or more partitions, but does not support using firmware to route I/O between a virtual and physical resource address.

Applicant's invention as shown in claims 14-17, 27, and 28-32 as supported in the language of the claims, includes the use of firmware as a tool for routing I/O between a virtual address and a physical address. It is the routing and the tool used for the routing that supports the dynamic characteristic associated therewith.

For it to be obvious to combine prior art references, the references must teach, suggest, or motivate one with ordinary skill in the art to combine the references and create the claimed invention. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP §2143.01. The *Henderson et al.* patent does support mapping a virtual address space object to a physical address space. However, *Henderson et al.* does not support the use of firmware associated with the claimed routing of a virtual address and a physical address. Although *Gulick et al.* briefly mentions that their invention may incorporate the use of system firmware, it does not teach the routing of objects between the virtual address space and the physical address space. In fact, since *Gulick et al.* does not teach the dynamic mapping element, which is claimed by Applicants,

it clearly does not teach using firmware to dynamically route a virtual resource address between a first and second physical resource. Accordingly, neither the *Henderson et al.* nor *Gulick et al.* teach or suggest the use of platform firmware to route addresses in the manner claimed by Applicants.

In fact, both *Henderson et al.* and *Gulick et al.* fail to address Applicant's use of platform firmware as a means of achieving the dynamic routing for improved system performance over that of the prior art. "Although a prior art device may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." MPEP §2143.01 (citing *In re Mills*, 916 F.2d 680, 682, 16 USPQ 2d. 1430 (Fed. Cir. 1990)). *Henderson et al.* does not suggest a modification to support the use of platform firmware to support the dynamic characteristic. To read *Henderson et al.* as providing the structure that supports the platform firmware would require a modification to the invention of *Henderson et al.* not envisioned or taught. Furthermore, there is no suggestion found in *Gulick et al.* for a modification to use a virtual address for an I/O resource wherein the platform firmware supports the functionality of combining both the virtual and physical resource addresses. The only suggestion for a system that utilizes platform firmware in the manner taught by Applicants is derived from Applicant's invention. Absent Applicant's invention, there is no suggestion or motivation within the combination of *Henderson et al.* and *Gulick et al.* for such a modification. "It is impermissible to use the claimed invention as an instructions manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ 2d 1780 (Fed. Cir. 1992) (citing *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991)). Yet this is the very process that the Examiner has attempted to undertake. Accordingly, the combination of the prior art references is improper as the Examiner's combination is precipitated by utilizing Applicant's claimed invention as the template to make the modifications suggested by the Examiner since such modifications to the prior art would make the prior art nonfunctional – which by its very nature makes such a combination non-obvious.

The teaching, suggestion, or motivation for combining the references must emanate from the references themselves, and not from Applicants. The prior art must teach the desirability of

the modification in question. "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon et al.*, 733 F.2d 900, 221 USPQ 1125, 1127 (Fed. Cir. 1984). There is no desire within the references themselves to combine the elements of the prior art to arrive at Applicant's invention. The desirability can be found at best only through the use of Applicant's invention. Therefore, the prior art references whether taken individually or in combination do not render Applicant's invention obvious as there is no teaching, suggestion, or motivation to combine the elements found in different prior art references having different purposes to build the product of Applicants. Accordingly, Applicants respectfully contend that the combination of *Henderson et al.* and *Gulick et al.* does not meet the standard set by the CAFC's interpretation of 35 U.S.C. §103(a), and respectfully requests allowance of claims 14-17, 27, and 28-32.

IV. 35 U.S.C. §103(a) - unpatentable over *Henderson et al.* in view of *Gulick et al.*

In the Office Action of July 22, 2004, the Examiner rejected claims 8-13 and 19-26 under 35 U.S.C. §103(a) as being unpatentable over *Henderson et al.* in view of *Gulick et al.*.

Applicants hereby incorporates the comments to *Henderson et al.* and *Gulick et al.* made above.

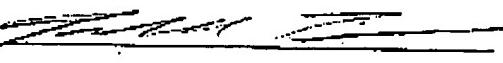
As discussed above, *Gulick et al.* does not teach or suggest dynamic routing of a virtual resource address to a physical resource address using firmware. In fact, *Gulick et al.* suggests use of a pointer and that "The pointer should be an offset from some base address, not a real or virtual address. The pointer should not be based on a virtual address because, when the nodes are heterogeneous nodes, they may not have a common virtual address translation." Col. 35, lines 9-13. This is the only discussion in the entire *Gulick et al.* references that even touches on a virtual address. Clearly *Gulick et al.* does not pertain to mapping a virtual resource address to a physical resource address. Furthermore, although *Henderson et al.* and *Gulick et al.* are both related to computer systems they do not appear to be solving the same or similar problems. The only suggestion and motivation to modify the teachings of *Henderson et al.* to support the use of firmware is taught by Applicants. There is no teaching or suggestion in *Henderson et al.* to implement firmware for virtual to physical address mapping. Furthermore, there is no teaching

or suggestion in *Gulick et al.* to map a virtual address space to a physical address space. "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon et al.*, 733 F.2d 900, 221 USPQ 1125, 1127 (Fed. Cir. 1984). There is no desire within the references themselves to combine the elements of the prior art to arrive at Applicant's invention. The desirability can be found at best only through the use of Applicant's invention. Therefore, the prior art references whether taken individually or in combination do not render Applicant's invention obvious as there is no teaching, suggestion, or motivation to combine the elements found in different prior art references having different purposes to build the product of Applicants. Accordingly, Applicants respectfully contend that the combination of *Henderson et al.* and *Gulick et al.* does not meet the standard set by the CAFC's interpretation of 35 U.S.C. §103(a), and respectfully requests allowance of claims 8-13 and 19-26.

In light of the foregoing amendments and remarks, all of the claims now presented are in condition for allowance, and Applicants respectfully request that the outstanding rejections be withdrawn and this application be passed to issue.

The Examiner is urged to call the undersigned at the number listed below if, in the Examiner's opinion, such a phone conference would aid in furthering the prosecution of this application.

Respectfully submitted,


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